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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

TRA, TUYEN Q

ART UNIT PAPER NUMBER

2873

DATE MAILED: 11/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/087,527

Applicant(s)

LIANG ET AL.

Examiner

Tuyen Q Tra

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-25 and 30-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23-25 is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-22 and 30-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4, 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claims 30 and 31 were previously allowed, now rejected in view of the new ground(s) of rejection.

Claim Objections

1. Claim 10 is objected to because of the following informalities:

Claim 10 recites "top electrode layer" while claim 9 and 8 recites "top electrode plate".

Appropriate correction is required.

Examiner question regard to claim 30, which reference number in which Figure is "the polymeric layer between the electrophoretic composition and the second electrode plate" referred to?

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 9 states "the electrode plate with the sealing layer is the top electrode plate" which is contrary to that of claim 8.

- Claims 10 and 15 recite the limitation "said adhesive layer" in line 1. There is insufficient antecedent basis for this limitation in the claim.

- Claim 16 is rejected because of depending on claim 15.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-7, 32-41, 45, 46, 48-52, 54 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshiro et al. (JP402284125A with the translation on page 2, lines 4-10).

a) With respect to claims 1-5 and 7, Oshiro et al. discloses a transmissive electrophoretic display in Fig. 4 comprising of a plurality of closed cells (7), each of the cells comprises surrounding partition walls, an electrophoretic composition filled therein, and a sealing layer (4) that is also a electrode layer, which is encloses the electrophoretic composition within each cell and sealingly adheres to the surface of the partition walls (the translation page 2, lines 4-10). However, Oshiro et al. does not implicitly disclose that the sealing layer is polymeric sealing layer.

The use of general material for sealing layer such as polymer are well known in the art of display device for purpose of lowing manufacture cost and labor as well as preventing device from breakage. Therefore, it would have been obvious to one skill in the art to make the sealing layer (4) from general material such as polymer for purpose lowing down the cost and preventing mirror from breakage.

b) With respect to claim 6, it should be noted from Oshiro et al.'s Fig. 2 and the translation (page 2, lines 4-10) that polymer is soluble in adhesive composition (9).

c) With respect to claim **32-41**, Oshiro et al. discloses an electrophoretic display in Figure 4 comprising a plurality of isolated closed cells (7) having well-defined size, shape and aspect ratio, said cells are formed from microcups with sealing layer. However, Oshiro et al. does not disclose the dimension of the cell about 1×10^2 to about $1 \times 10^6 \mu\text{m}^2$ or about 1×10^3 to about $1 \times 10^5 \mu\text{m}^2$ and polymeric sealing layer or the size and shape of the cells.

Although the Oshiro et al' cells does not teach exact the **shape or size of the cells** as having dimension of the cell from 1×10^2 to about $1 \times 10^6 \mu\text{m}^2$ or about 1×10^3 to about $1 \times 10^5 \mu\text{m}^2$ as that claimed by Applicant, the shape or size differences, **shape of cell area** are considered obvious design choices and are not patentable unless unobvious or unexpected results are obtained from these changes. Additionally, the Applicant has presented no discussion in the specification which convinces the Examiner that the particular **shape or size of the cells with** the opening to the dimension of the cell from 1×10^2 to about $1 \times 10^6 \mu\text{m}^2$ or about 1×10^3 to about $1 \times 10^5 \mu\text{m}^2$ is anything more than one of numerous shapes or sizes a person of ordinary skill in the art would find obvious for the purpose of optimizing performance. It appears that these changes produce no functional differences and therefore would have been obvious.

d) With respect to claims **45, 46 and 48-50**, Oshiro et al. discloses an electrophoretic display device comprising of sealing layer. However, Oshiro et al. does not specifically disclose that the sealing layer is a thermoplastic, thermoset, a precursor, or UV curable composition.

Since thermoplastic, thermoset or a precursor function as sealing material, the selection of thermoplastic, thermoset or a precursor instead of polymer sealing is seem as design experience upon the environment of use to ensure optimum performance. Therefore, it would

have been obvious at the time the invention was made to a person having skill in the art to replace polymer sealing in optical device thermoplastic, thermoset, a precursor or UV curable composition for matter of design choice.

e) With respect to claims **51** and **52**, Oshiro et al. further discloses the sealing composition layer is dissolved in an organic solvent that is incompatible with the dielectric solvent of the electrophoretic fluid since there must be an organic solvent which can dissolve sealing composition without any relationship with the dielectric solvent of the electrophoretic fluid (see Fig. 4).

f) With respect to claims **54** and **55**, Oshiro et al. further discloses wherein the electrophoretic composition is partially filled in the cells; wherein the filled electrophoretic fluid is in contact with the sealing layer (see Fig 4).

5. Claim **42-44** are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshiro et al., as applied to claim 2 above, in view of Jacobson (U.S. Pat. 5,930,026).

Oshiro et al. discloses a transmissive electrophoretic display with cells filled with pigments in a dielectric solvent. However, Oshiro et al. does not disclose the pigments are white pigment. Within the same field of endeavor, Jacobson et al. discloses an electrophoretic display with selected cells in a pre-determined area are filled with a suspension of white pigment in a dielectric solvent of a predetermined color (col.5, lines 17-21).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct a transmissive electrophoretic display such as disclosed by Gordon et al., with white pigment in dielectric solvent such as discloses by Jacobson et al. for purpose of minus charging for a subtractive color system.

6. Claims **8-10, 12-16, 30, 31** and **53** are rejected under 35 U.S.C. 103(a) as being unpatentable over Harbour et al. (Xerox Disclosure Journal, vol. 4, Number 6, November/December 1979, page 705).

a) With respect to claims **8, 9** and **12**, Harbour et al. discloses electrophoretic display device comprising of one top electrode plate (5) and one bottom electrode plate (13), at least one of which (5) is transparent; and a plurality of cells (17) enclosed between the two electrodes, each of the cells comprising surrounding partition walls (9), an electrophoretic composition (19) filled therein, and a sealing layer (7) which encloses the electrophoretic composition with each cell and sealingly adheres to the surface of the partition walls (page 705, line 1-11), an adhesive layer (not shown) between the first electrode plate (5) and the sealing layer (7). However, Harbour et al. does not implicitly disclose that the sealing layer is polymeric sealing layer.

The use of general material for sealing layer such as polymer are well known in the art of display device for purpose of lowing manufacture cost and labor as well as preventing device from breakage. Therefore, it would have been obvious to one skill in the art to make the sealing layer from general material such as polymer for purpose lowing down the cost and preventing mirror from breakage.

b) With respect to claim **10**, Harbour et al. discloses the adhesive layer between the sealing layer (7) and the top electrode layer plate.

c) With respect to claim **15**, Harbour et al. discloses the sealing layer (7) adhered to the top electrode (5). However, Harbour et al. fails to disclose the sealing layer is made the same material as adhesive layer with the same material. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make adhesive layer with the same material with the sealing layer (7), since it has been held that mere duplication of the essential working material of a device involves only routine skill in the art. In addition, applicant presents no discussion that could convince examiner any technical advantage of using the same material for the sealing and adhesive layer. It, therefore, would have been obvious as a matter of design choice.

d) With respect to claim **13, 14 and 16**, the teaching of Harbour et al. is described with reference to claim 8 above; however, Harbour et al. does not teach that the adhesion is a pressure sensitive adhesive, a hot-melt adhesive, a heat, moisture or radiation curable adhesive.

Since pressure sensitive adhesive, a hot-melt adhesive, a heat adhesive, moisture or radiation curable adhesive function as an adhesive material, the selection of the pressure sensitive adhesive, a hot-melt adhesive, a heat adhesive, moisture or radiation curable adhesive is seen as design experience upon the environment of use to ensure optimum performance.

Therefore, it would have been obvious at the time the invention was made to a person having skill in the art to use any of pressure sensitive adhesive, a hot-melt adhesive, a heat adhesive,

moisture or radiation curable adhesive in electrophoretic device as an adhesive material for matter of design choice.

e) With respect to claim **30**, Harbour et al. discloses electrophoretic display device comprising of one top electrode plate (5) and one bottom electrode plate (13), array of cells (17) enclosed between the two electrodes, each of the cells filled with an electrophoretic composition comprising of charged particles dispersed in a dielectric solvent or solvent mixture and is individually sealed by a sealing layer (7) (page 705, line 1-11), an adhesive layer (not shown) between the first electrode plate (5) and the sealing layer (7); a layer between the electrophoretic composition and the second electrode plate. However, Harbour et al. does not implicitly disclose the layer is a polymeric layer.

The use of general material such as polymer are well known in the art of display device for purpose of lowering manufacture cost and labor as well as preventing device from breakage. Therefore, it would have been obvious to one skill in the art to construct the layer from general material such as polymer for purpose lowering down the cost and preventing mirror from breakage.

f) With respect to claim **31**, Harbour et al. further discloses wherein the sealing layer between the electrophoretic composition and the second electrode plate is formed of the same composition as the material constituting in the cells.

g) With respect to claim 53, Harbour et al. further discloses a layer between the electrophoretic fluid and the bottom electrode layer. However, Harbour et al. does not implicitly disclose that the layer is polymer.

The use of general material for layer such as polymer are well known in the art of display device for purpose of lowering manufacture cost and labor as well as preventing device from breakage. Therefore, it would have been obvious to one skill in the art to make the sealing layer from general material such as polymer for purpose lowering down the cost and preventing mirror from breakage. In addition, applicant does not present any discussion to convince examiner such layer can provide any further technical advance rather support. Therefore, it would be obvious as the master of design choice.

9. Claims 17-22 are rejected under 35 U.S.C.103(a) as being unpatentable over Harbour et al. (Xerox Disclosure Journal, vol. 4, Number 6, November/December 1979, page 705) in view of Robusto (U.S. 3,928,671A).

a) With respect to claim 17, Harbour et al. discloses a bottom electrode (13); however, Harbour et al. does not teach bottom transparent electrode. Within the same field of endeavor, Robusto et al. teaches electrophoretic device with a bottom transparent electrode (col. 8, lines 34-36).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct the electrophoretic device with bottom electrode such as disclosed Harbour et al.(with translation), with bottom transparent electrode such as discloses by Robusto et al., for purpose of transmitting light from back light to electrophoretic device.

b) With respect to claim **18**, Harbour et al. further discloses wherein top electrode layer (5) is adhered to the sealing layer (7).

c) With respect to claim **21**, Harbour et al. discloses a sealing layer (7) adhered to adhesive layer, but fails to disclose the sealing layer and adhesive layer formed from the same material. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the sealing and adhesive layer of the same material since it has been held that mere duplication of the essential working material of a device involves only routine skill in the art. In addition, applicant presents no discussion that could convince examiner any technical advantage of using the same material for the sealing and adhesive layer. It, therefore, would have been obvious as a matter of design choice.

d) With respect to claim **19, 20 and 22**, the teachings of Harbour et al. in view of Robusto are described with reference to claim 17 above; however, Harbour et al. in view of Robusto does not teach the adhesion is through an adhesive layer formed from a pressure sensitive adhesive, a hot-melt adhesive, a heat, moisture or radiation curable adhesive.

Since pressure sensitive adhesive, a hot-melt adhesive, a heat adhesive, moisture or radiation curable adhesive function as an adhesive material, the selection of the pressure sensitive adhesive, a hot-melt adhesive, a heat adhesive, moisture or radiation curable adhesive is seen as design experience upon the environment of use to ensure optimum performance. Therefore, it would have been obvious at the time the invention was made to a person having skill in the art to use any of pressure sensitive adhesive, a hot-melt adhesive, a heat adhesive, moisture or

radiation curable adhesive in electrophoretic device as an adhesive material for matter of design choice.

Allowable Subject Matter

11. Claims 23-25 are allowed.

The reason for the indication of allowable subject matter is that (claim 23) the process for manufacturing an electrophoretic display comprising imagewise exposure through a photomask which moves at the same speed as a web substrate disclosed in the claims is not found in the prior art.

RESPONSE TO APPLICANT'S ARGUMENT

12. Applicant's arguments filed on 8/30/2002 have been fully considered but they are not persuasive.

Applicant argued in REMARK that Oshiro's reference does not have sealing layer instead an electrode layer on top of the cell and the electrode in direct contact with electrophoretic fluid while applicant's device with sealing layer and electrode is not in contact with electrophoretic fluid. Examiner disagree with applicant since there are no any electrode layer found in applicant's claim 1, and Oshiro et al. reference has taught an electrode layer which is not limited to the function of electrode, but also preventing fluid from overflowing. In other word, Oshiro's electrode (4) also functions as a sealing layer. In addition, adhesive is a general material used in optical device; therefore, it would have been obvious to use adhesive layer in electrophoretic display device. Furthermore, polymer is general and common material used in adhering as well as sealing material; therefore, it would be obvious to one skilled in the art to use such material in sealing or adhering layer.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuyen Tra whose telephone number is (703) 306-5712. The examiner can normally be reached on Monday to Friday from 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps, can be reached on (703) 308-4883. The fax number for this Group is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

Examiner: Tuyen Tra

Date: November 5, 2002


Hung Xuan Dang
Primary Examiner